

REMARKS

This is intended as a full and complete response to the Office Action dated June 4, 2004, having a shortened statutory period for response set to expire on September 7, 2004. Claims 1-15, 17, and 19-44 remain pending in the application and are shown above. Claims 1-15, 17, and 19-44 are rejected by the Examiner. Applicants submit new claims 45-60 for consideration by the Examiner. Reconsideration of the rejected claims is requested for reasons presented below.

Claims 1-15, 17 and 19-35 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 5, 9-11, 17-24, 27, 34 and 37 of co-pending Application No. 10/799,146 in view of *Lin, et al.* U.S. Patent No. 6,187,505. Applicants respectfully traverse the rejection.

Commonly assigned and co-pending Application No. 10/799,146 was filed on March 12, 2004. Applicants respectfully disagree with the Examiner's assertion of the obviousness-type double patenting rejection with regard to the co-pending Application No. 10/799,146, on grounds that obviousness-type double patenting requires two-way obviousness, and the claims of co-pending Application No. 10/799,146 are not obvious over the claims of the present application. Applicants request withdrawal of the obviousness-type double patenting rejection with regard to co-pending Application No. 10/799,146.

Lin, et al. discloses a process for forming a negative tone photoresist composition from a composition of an aqueous base soluble phenolic silicon containing polymer, a cross-linking agent, an acid generator, a solvent for the polymer resin and crosslinking agent, and optionally, a photosensitizer, a base, or a surfactant (See Column 3, Line 50, to Column 4, lines 10). The silicon containing polymer component portion of the photoresist is described as having a silicon content of at least about 5 wt. %, and more preferably at least about 10 wt. %. (See Column 4, Lines 11 – 20). *Lin et al.* further discloses that the resist composition may be used in a multi-layer imaging scheme for manufacturing of semiconductor devices. (See Column 8, Lines 11-35)

Lin, et al. does not depositing an amorphous carbon layer on a substrate by a process comprising providing a gas mixture to the deposition chamber, wherein the gas mixture comprises an inert gas and one or more hydrocarbon compounds, maintaining the deposition chamber at a pressure between about 1 Torr to about 20 Torr, reacting

the gas mixture to form an amorphous carbon layer, and depositing a silicon containing photoresist layer on top of the amorphous carbon layer.

Thus, *Lin, et al.* does not teach, show, or suggest depositing an amorphous carbon layer on a substrate by a process comprising providing a gas mixture to the deposition chamber, wherein the gas mixture comprises an inert gas and one or more hydrocarbon compounds, maintaining the deposition chamber at a pressure between about 1 Torr to about 20 Torr, reacting the gas mixture to form an amorphous carbon layer, depositing a silicon containing photoresist layer on top of the amorphous carbon layer, developing a pattern transferred into the resist layer with an ultraviolet radiation photolithographic process, and forming an in situ resist layer hard mask in an outer portion of the photoresist layer while etching through the amorphous carbon layer in at least one region defined by the pattern in the resist layer, as recited in claim 1, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1-15, 17, and 19-35 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 8, 9, and 19 of co-pending Application No. 10/800,112, in view of *Lin, et al.* U.S. Patent No. 6,187,505. Applicants respectfully traverse the rejection.

Commonly assigned and co-pending Application No. 10/800,112 was filed on March 12, 2004. Applicants respectfully disagree with the Examiner's assertion of the obviousness-type double patenting rejection with regard to the co-pending Application No. 10/800,112, on grounds that obviousness-type double patenting requires two-way obviousness, and the claims of co-pending Application No. 10/800,112 are not obvious over the claims of the present application. Applicants request withdrawal of the obviousness-type double patenting rejection with regard to co-pending Application No. 10/800,112.

Lin, et al. is described above and *Lin, et al.* does not teach, show, or suggest depositing an amorphous carbon layer on a substrate by a process comprising providing a gas mixture to the deposition chamber, wherein the gas mixture comprises an inert gas and one or more hydrocarbon compounds, maintaining the deposition chamber at a pressure between about 1 Torr to about 20 Torr, reacting the gas mixture to form an amorphous carbon layer, depositing a silicon containing photoresist layer on top of the amorphous carbon layer, developing a pattern transferred into the resist layer

with an ultraviolet radiation photolithographic process, and forming an in situ resist layer hard mask in an outer portion of the photoresist layer while etching through the amorphous carbon layer in at least one region defined by the pattern in the resist layer, as recited in claim 1, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to the Applicant's disclosure than the primary references cited in the office action. Therefore, Applicant believes that a detailed discussion of the secondary references is not necessary for a full and complete response to this office action.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed. Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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